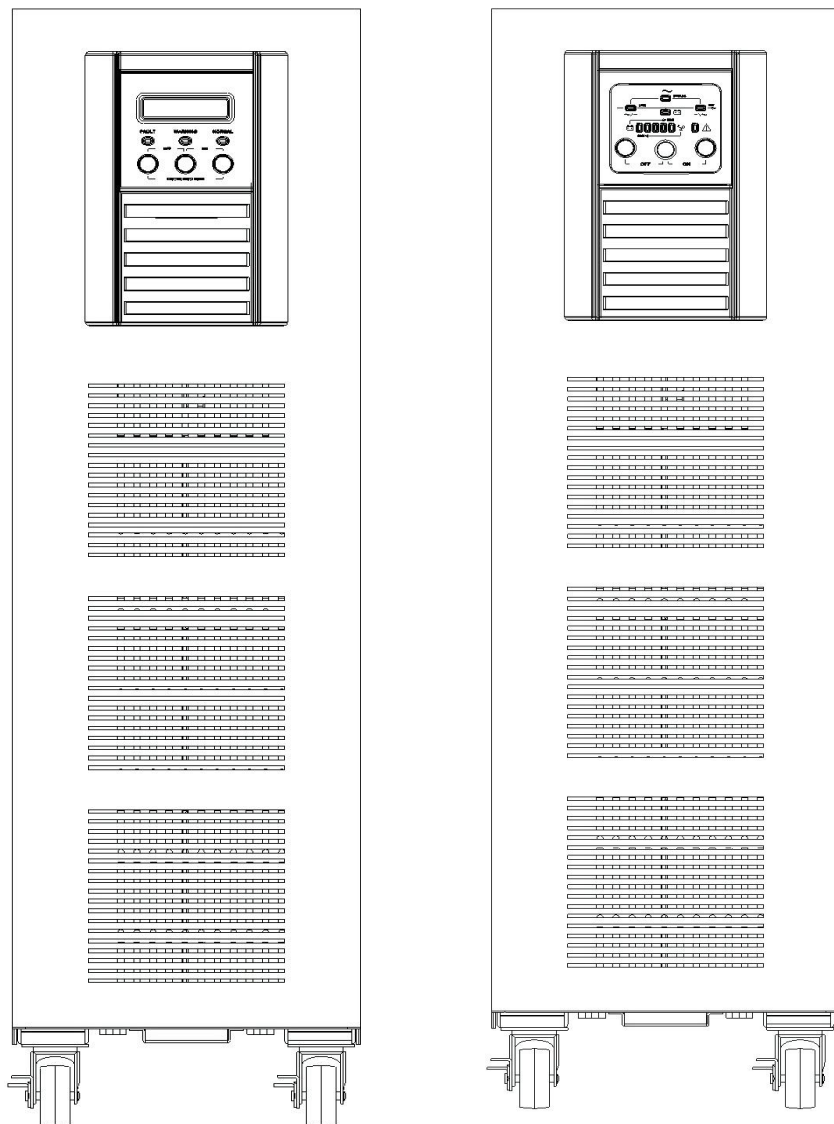




FRUK19-6K / FRUK19-10K / FRUK19-15K ONLINE-UPS



Uninterrupted Power Supply

Contents

- 1. Safety Instructions 1-3
 - 1.1 Transport.....2
 - 1.2 Set-up2
 - 1.3 Installation2
 - 1.4 Operation.....3
 - 1.5 Maintenance, Servicing and Faults3
- 2. Description of Commonly Used Notations4
- 3. Introduction5
- 4. System Description6
- 5. Connection and Operation..... 7-17
 - 5.1 Unpacking and Inspection for FRUK19-6K/FRUK19-10K.....7
 - 5.2 Input and output power cords and protective earth ground installation.....7-8
 - 5.3 Operating procedure for connecting the external battery.....9
 - 5.4 Parallel operation.....10
 - 5.5 Operation and Operation Mode.....11-17
- 6. Product Description18
- 7. Trouble Shooting.....19
- 8. Maintenance.....20
 - 8.1 Operation.....20
 - 8.2 Storage20
- 9. Operating 21-25
- 10. Communication Port26
- 11. Appendix 1 - Back Panel27
- 12. Appendix 2 - Display panel-LED.....28-29

1. Safety Instructions

Please read the FOLLOWING user manual and the safety instructions before installing the unit and starting it up!

1.1 Transport

Please transport the UPS system only in the original packaging (to protect against shock and impact).

1.2 Set-up

Condensation may occur if the UPS system is moved directly from a cold environment to a warm environment. The UPS system must be absolutely dry before being installed. Please allow an acclimatization time of at least two hours.

Do not install the UPS system near water or in damp environments.

Do not install the UPS system to where it would be exposed to direct sunlight or near heat.

Do not block off ventilation openings in the housing of the UPS system.

1.3 Installation

Do not connect appliances or equipments, which would overload the UPS system (e.g. Laser printers), to the UPS outlet sockets

Place cables in such a way that no one can step on or trip over them.

Do not connect domestic appliances such as hair dryers to the UPS outlet sockets.

The UPS can NOT be operated by any individuals with no previous experience

Connect only SAME BRAND and SAME CAPACITY external batteries to the optional External Battery Socket

Please connect equal quantity of external batteries as the internal batteries to the optional External Battery Socket

1.3.1 Installation for 6K / 10K

Warning: This is a product for restricted sales distribution to informed partners.

A readily accessible disconnect device shall be incorporated in the building installation wiring and must be close to the UPS system.

This is equipment that is permanently connected; only qualified maintenance personnel are allowed to carry out installations.

1. Safety Instructions

1.4 Operation

The UPS system features its own, internal current source (batteries). The UPS output sockets or output terminal blocks may be electrically live, even if the UPS system is not connected to the wiring socket outlet of the building.

In order to fully disconnect the UPS system, first press the Standby switch, then disconnect the main lead.

Ensure that there are no fluids or other foreign objects that can enter into the UPS system.

The UPS operates with hazardous voltages. Only qualified maintenance personnel are allowed to carry out repair jobs.

1.5 Maintenance, servicing and faults

Caution - risk of electric shock. Even after the UPS is disconnected from the mains power supply (building wiring socket outlet), components inside the UPS system are still connected to the battery and are still electrically live and dangerous.

Before carrying out any kind of servicing and/ or maintenance, disconnect the batteries and verify that no current is present and no hazardous voltage exists in the terminals of high capability capacitors, such as BUS-capacitors.

Only persons who are adequately familiar with batteries and with the required precautionary measures are allowed to replace batteries and supervise operations. Unauthorised persons must be kept well away from the batteries.

Caution - risk of electric shock. The battery circuit is not isolated from the input voltage. Hazardous voltages may occur between the battery terminals and the ground. Before touching, please verify that no voltage is present!

Batteries may cause electric shock and have a high short-circuit current. Please take the precautionary measures specified below and any other necessary measures when working with batteries:

- remove wristwatches, rings and other metal objects
- Only use tools with insulated grips and handles.

Replace batteries with the same number and same type of batteries.














Do not attempt to dispose of batteries by burning them. This could cause battery explosion.

Do not open or destroy batteries. Escaping electrolyte can cause injury to the skin and eyes. It may be toxic.

Please replace the fuse only by a fuse of the same type and of the same amperage in order to avoid fire hazards.

2. Description of commonly used notations

Some or all of the following notations may be used in this manual and may appear in your application process. Therefore, all users should be familiar with them and understand their explanations.

Notation and Explanation	
Notation	Explanation
	Alert you to pay special attention
	Caution of high voltage
	Turn on the UPS
	Turn off the UPS
	Idle or shut down the UPS
	Alternating current source (AC)
	Direct current source (DC)
	Protective ground
	Alarm silence
	Overload indication
	Battery check
	Recycle
	Keep UPS in a clear area

3. Introduction

POWER-ALL MODE FRUK-01 Series products belong to the ON-LINE Uninterrupted Power Supply (UPS) System which incorporates double-conversion technology. It provides perfect protection specifically for Novell, Windows NT and UNIX servers.

The double-conversion principle eliminates all mains power disturbances. A rectifier converts the alternating current from the socket outlet to direct current. This direct current charges the batteries and powers the inverter. On the basis of this DC voltage, the inverter generates a sinusoidal AC voltage, which permanently supplies the loads.

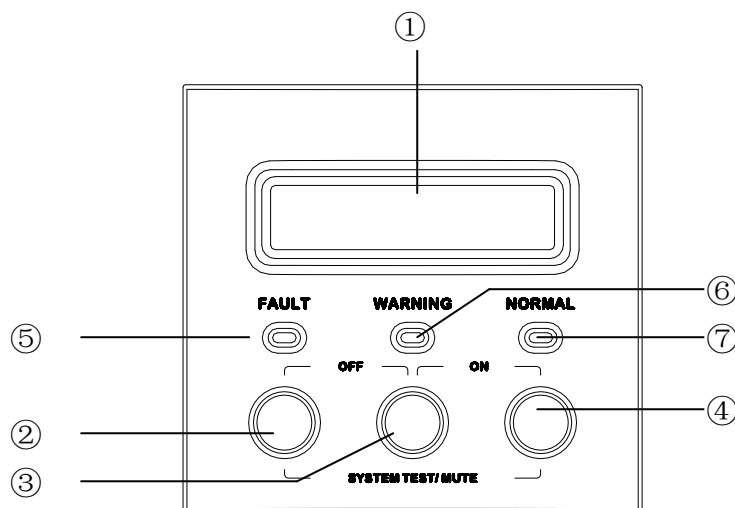
Computers and peripherals are thus powered entirely by the mains voltage. In the event of power failure, the maintenance-free batteries power the inverter.

This manual covers the UPS listed as follows. Please confirm whether it is the model you intend to purchase by performing a visual inspection of the Model No. on the rear panel of the UPS.

Model No.	Type
FRUK19-6K	Standard
FRUK19-10K	
FRUK19-15K	Long backup time

4. System Description

Display Panel



Display Panel

Switch	Function
ON/OFF CONTROL KEY(4)	When this key is pressed with the LCD Select Down-key simultaneously for 3 seconds, the UPS will be switched on. Besides, in the mode of battery back-up, press both of this key and LCD Select Up-key at the same time to disable the beeps.
Select Up-key(2)	It is pressed to select upward the UPS status on LCD Display. When this key is pressed with the LCD Select Down-key simultaneously for 3 seconds, the UPS will be switched off.
Select Down-key(3)	It is pressed to select downward the UPS status on LCD Display.

Display	Function
LCD Display(1)	This indicates the UPS operation information, including UPS status, input/output voltage, input/output frequency, battery voltage, battery capacity left, output load, inside temperature, and the time of history events.
Fault LED (5)	This red LED indicates the UPS is in fault condition because of inverter abnormal, over-temperature or DC_BUS fault.
Warning LED (6)	This yellow LED indicates that the UPS is in the status of overload, bypass and battery back-up.
Normal LED (7)	This green LED indicates that the UPS operates normally.

5. Connection and Operation

The system can only be installed and wired by qualified electricians in accordance with applicable safety regulations!

5.1 *Unpacking and Inspecting for FRUK19-6K / FRUK19-10K*

- 1) Unpack the packaging and check the package contents. The shipping package contains:
 - A UPS
 - A user manual
 - A communication cable
 - A battery cable
- 2) Inspect the appearance of the UPS to see if there is any damage during transportation. If there is any damage or lacking of any parts, do not turn on the unit and immediately notify the carrier and dealer.

5.2 *Input and output power cords and protective earth ground installation*

1. Notes for installation

- 1) The UPS must be installed in a location with good ventilation, far away from water, inflammable gas and corrosive agents.
- 2) Ensure the air vents in the front and rear of the UPS are not blocked. Allow at least 0.5 meter of space at each side.
- 3) Condensation to water drops may occur if the UPS is unpacked in a very low temperature environment. In this case, it is necessary to wait until the UPS is fully dried inside out before proceeding installation and use. Otherwise there will be hazards of electric shock.

2. Installation

Installation and wiring must be performed by professional personnel in accordance with the local electric code and the following instructions.

For safety reason, please switch off the mains power and the battery before installation.

- 1) Open the terminal block cover located in the rear panel of the UPS; please refer to the appearance diagram.
- 2) For FRUK19-6K UPS, it is recommended to select the UL1015 10AWG (6mm²) wire or other insulated wire which complies with AWG Standard for the UPS input wirings and select the UL1015 8AWG (10mm²) wire or other insulated wire which complies with AWG Standard for the UPS output wirings.
- 3) For FRUK19-10K, it is recommended to select the UL1015 8AWG (10mm²) wire or other insulated wire which complies with AWG Standard for the UPS input wirings and select the UL1015 6AWG (25mm²) wire or other insulated wire which complies with AWG Standard for the UPS output wirings.

5. Connection and Operation

- 4) For FRUK19-15K, it is recommended to select the UL1015 6AWG (25mm²) wire or other insulated wire which complies with AWG Standard for the UPS input wirings and select the UL1015 4AWG wire or other insulated wire which complies with AWG Standard for the UPS output wirings.

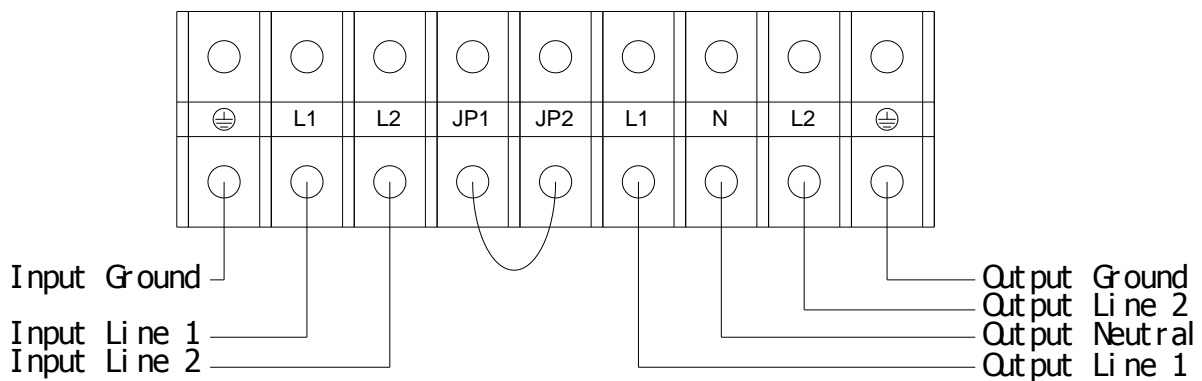
Note: Do not use the wall receptacle as the input power source for the UPS, as its rated current is less than the UPS's maximum input current. Otherwise the receptacle may be burned and destroyed.

- 5) Connect the input and output wires to the corresponding input and output terminals according to the following diagram.

Note: you must make sure that the input and output wires and the input and output terminals are connected tightly.

- 6) The protective earth ground wire refers to the wire connection between the equipment, which consumes electric equipment, and the ground wire. The wire diameter of protective earth ground wire should be at least as above mentioned for each model and green wire or green wire with yellow ribbon wire is used.
- 7) After having completed the installation, make sure the wiring is correct.
- 8) Please install the leak current protective breaker at the output power distribution panel of the UPS, if necessary.
- 9) To connect the load with the UPS, please turn off all the loads first, then perform the connection and finally turn on the loads one by one.
- 10) No matter the UPS is connected to the utility power or not, the output of the UPS may have electricity. The parts inside the unit may still have hazardous voltage after turning off the UPS. To make sure the UPS have no output, power off the UPS, and then disconnect the utility power supply.
- 11) It is recommended to charge the batteries for at least 8 hours before use. After connection, turn the input breaker to the "ON" position, and the UPS will charge the batteries automatically. You can also use the UPS immediately without charging the batteries first, but in this case the backup time will be less than the standard value.
- 12) If it is necessary to connect the inductance load such as a monitor or a laser printer to the UPS, the start-up power must be taken into consideration when calculating the capacity of the UPS, as its start-up power consumption is huge when it is started.

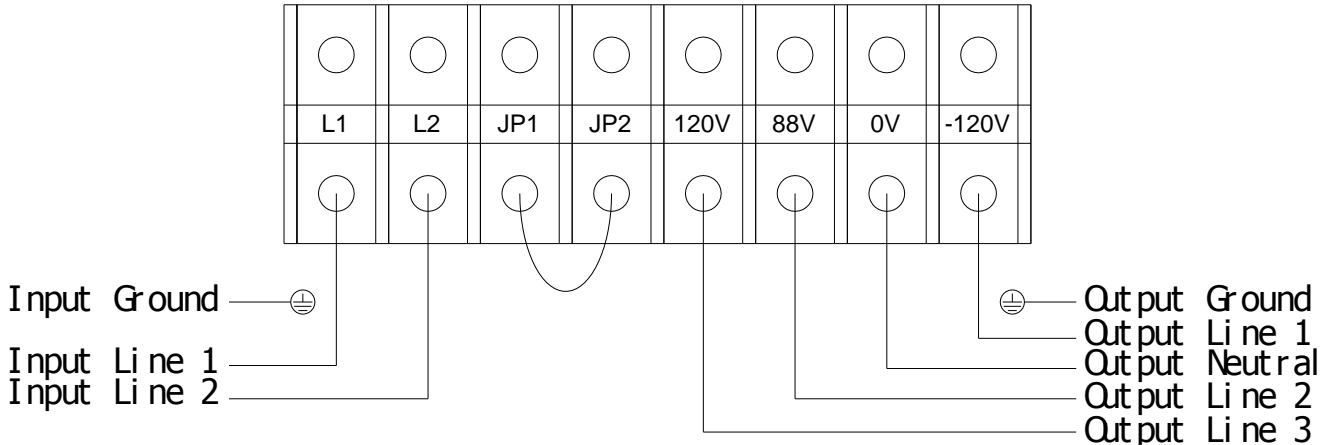
5. Connection and Operation



Input and output Terminal Block wiring diagram of
FRUK19-6K / FRUK19-10K

If you want, then voltage 240V, L1 to L2 and connected, 120V if access will be N and L1 (or L2) phase, and then to be two groups with 50%.

Important notes: If the UPS is used in single mode, JPI and JP2 must be connected by 10AWG (6mm²). If the UPS is used in parallel mode, the Jumper between JP1 and JP2 must be removed.



Input and output Terminal Block wiring diagram of
FRUK19-15K

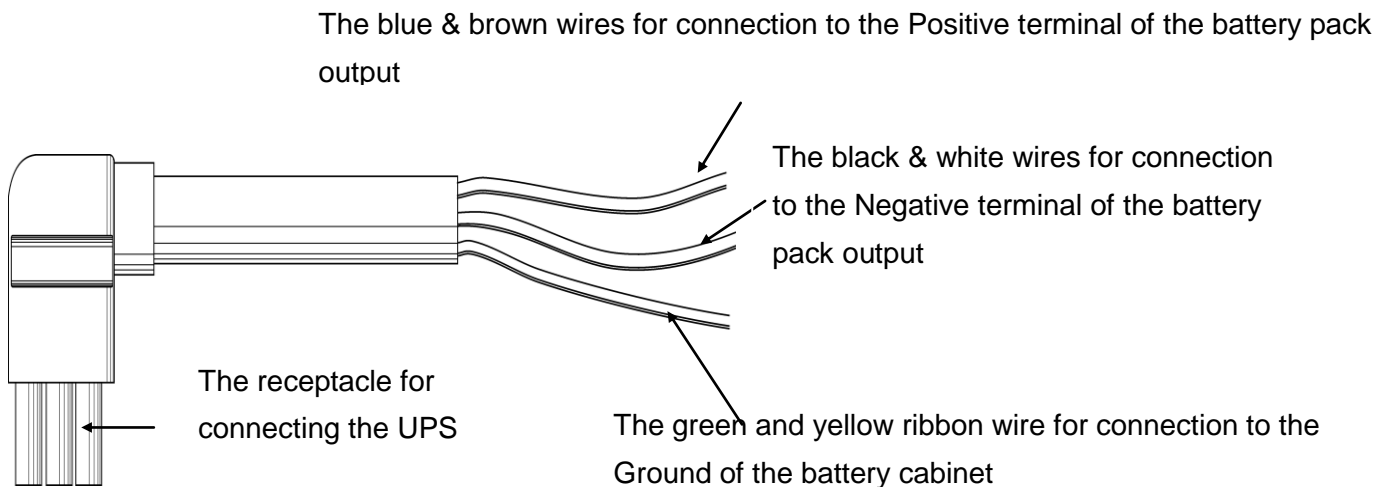
If you want, then voltage 208V, 88V to -120V and connected, 120V if access will be 0V and 120V (or -120V) phase, and then to be two groups with 50%.

Important notes: If the UPS is used in single mode, JPI and JP2 must be connected. If the UPS is used in parallel mode, the Jumper between JP1 and JP2 must be removed.

5. Connection and Operation

5.3 Operating procedure for connecting the external battery

1. The nominal DC voltage of external battery pack is 240VDC. Each battery pack consists of 20 pieces of 12V maintenance-free batteries in series. To achieve longer backup time, it is possible to connect multi-battery packs, but the principle of “same voltage, same type” should be strictly observed.
2. The connector of the external battery cable is used to plug into the external battery socket of the UPS, the other end of the external battery cable is made of three open wires with ring terminals to connect with the external battery pack(s). The procedure of installing battery bank should be strictly observed. Otherwise, you may encounter the hazardous electric shock.
 - 1) A DC breaker must be connected between the battery pack and the UPS. The capacity of breaker must NOT be less than the data specified in the general specification.
 - 2) Set the battery pack breaker to “OFF” position and connect these 20 pieces of batteries in series.
 - 3) You must connect the external battery cable to the battery first. If you connect the cable to the UPS first, you may encounter the hazardous electric shock. The positive pole of the battery is connected to the FRUK19-10K/15K in parallel with blue and brown wires; the negative pole of the battery is connected to the FRUK19-10K/15K in parallel with black and white wires; the green and yellow ribbon wire is connected to the ground of the battery cabinet.
3. To complete the connection by plugging the connector of the external battery cable into the external battery socket of the UPS, do not attempt to connect any loads to the UPS now. You should connect the input power wire to the right position first. And then set the breaker of the battery pack to the ON position. After that, set the input breaker to the ON position. The UPS begins to charge the battery packs at the time.



5. Connection and Operation

5.4 Parallel operation

1. Brief introduction of the redundancy

$N+X$ is currently the most reliable power supply structure. N represents the minimum number of UPS that the total load requires; X represents the redundant UPS number, i.e. the fault UPS number that the redundant system structure can handle simultaneously. The bigger the X is, the higher the reliability of the power system is. For occasions where reliability is highly depended on, $N+X$ is the optimal mode.

As long as the UPS is equipped with parallel cables, up to 3 UPSs can be connected in parallel to realize the application of “output power sharing” and “output power redundancy”.

2. Parallel installation

- 1) Users need to adopt a standard 25-pin communication cable, which should have 25 cores, corresponding stitches and shield, as the UPS parallel cable. The length of the parallel cable is appropriate to be less than 3 meters.
- 2) Strictly follow the stand-alone wiring requirements to perform the input wiring of each UPS.
- 3) Connect the output wires of each UPS to an output breaker panel.
- 4) Disconnect the Jumper on JP1 and JP2 of the terminal block first, and connect each output breaker to a main output breaker and then to the loads.

The requirements of the output wiring are as follows:

- When the distance between the UPSs in parallel and the breaker panel is less than 20 meters, the difference between the wires of input & output of the UPSs is required to be less than 20%.
- When the distance between the UPSs in parallel and the breaker panel is greater than 20 meters, the difference between the wires of input & output of the UPSs is required to be less than 10%.

5. Connection and Operation

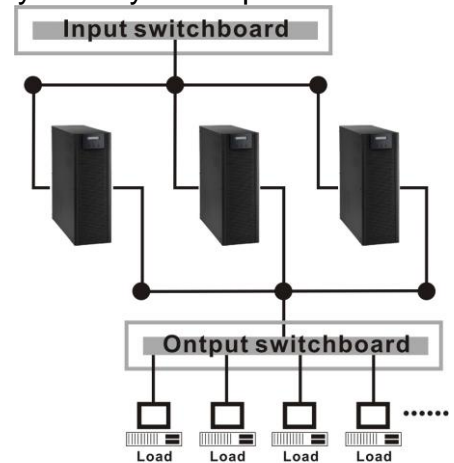
5.5 Operation and Operation Mode

Operation and maintenance

- 1) To perform the general operation, follow the stand-alone operating requirements.
- 2) Startup: The UPS units transfer to Normal mode simultaneously as they start up sequentially in utility power mode.

Shutdown: the UPS units shut down sequentially in INV mode. When the last one completes the shutdown procedure, each UPS unit will simultaneously shut down the inverter and transfer to bypass mode.

It is easy to operate the equipment, without previous training. You just need to read through this manual and operate according to the instructions in it. For the meaning of the LED indicators, please refer to the appendix 1 “Display Panel”



Parallel Installation Diagram

5.5.1 Operation

1. Turn on the UPS with utility power supplied (in Line mode/ AC mode)

- 1) After you make sure that the power supply connection is correct, set the bypass breaker and the input breaker to the “ON” position first. At this moment the fan rotates and the UPS supplies power to the load via the bypass circuit. The UPS operates in Bypass mode.
- 2) By pressing the On/ Off Control Key and the LCD Select Down-Key on the UPS simultaneously for 3 seconds until the buzzer beeps twice, then the UPS will start up and the Normal LED lights up to indicate that the power is from its inverter to the load.
- 3) After being powered on, the UPS will perform self-diagnosis. After a few seconds, the Normal LED will be turned on, and now the UPS has already run in Utility Power mode. If the utility power is abnormal, the UPS will operate in Battery mode without output interruption of the UPS.

2. Turn on the UPS with no utility power supplied (in Battery mode)

- 1) To power on the UPS, press the On / Off Control Key and the LCD Select Down-key simultaneously and continue for more than 3 second.

5. Connection and Operation

- 2) During the course of starting up, the UPS has the same action as if it is connected to utility power except that the Normal LED is not turned on and instead the Warning LED is turned on.

3. Turn off the UPS with utility power supplied (in Line mode/ AC mode)

- 1) Press the LCD Select Up-key and the LCD Select Down-key simultaneously, and continue for more than 3 second to turn off the inverter of the UPS immediately.
- 2) After being powered off, the UPS will perform self-diagnosis, the Normal LED will flash to indicate that the UPS is working in Bypass mode.
- 3) Upon completion of the above procedures to turn it off, output of electric current of the UPS is still present. In order to cut off the output from the UPS, simply cut off the utility power supply and the UPS will perform self-diagnosis, finally no display is shown on the display panel and no voltage output is available from the UPS output.

4. Turn off the UPS with no utility power supplied (in Battery mode)

- 1) Press the LCD Select Up-key and the LCD Select Down-key simultaneously, and continue for more than 3 second to power off the UPS.
- 2) After being powered off, the UPS will perform self-diagnosis. Finally no display is shown on the display panel and no voltage is available from the UPS output.

Suggestions: Please turn off the connected loads before turning on the UPS and turn on the loads one by one after the UPS is working in INV mode. Turn off all of the connected loads before turning off the UPS.

5. Parallel Machine Maintenance

This UPS system has the parallel machine function, if you want to add one single machine to the parallel system, please follow the operating process to join a new machine; if you have to remove UPS from the parallel system because of cutting down load or attaining UPS, please follow the operating process to remove from the parallel machine.

Operating process of adding a new UPS :

- a) Before adding a new unit, please prepare the input and output wires, the switches and the parallel cable;
- b) Turn off the input and output breakers of the new unit. Connect the input and output wires as well as the battery pack according to the mark on the terminal block.
Remove the short connection wire between JP1 and JP2 on the terminal block;
- c) Turn off the UPS systems that are running. After all the running UPSs transfer to the bypass mode, remove the maintenance cover board of each UPS and set the maintenance switch from “UPS” to “BPS”, then cut off the input breaker of each UPS.

5. Connection and Operation

- d) If the UPS system, that is running, is a stand-alone UPS, you need to remove the short connection wire between JP1 and JP2 on the terminal block.
- e) Remove the cover board of the parallel port on the new UPS, push one end of the parallel cable into the slot of the parallel kit and screw up the connector; screw the cover board of the parallel port back again.
- f) Remove the maintenance cover board of the new UPS and set the maintenance switch from “UPS” to “BPS”.
- g) Turn on the battery switch and the external input breaker of the new UPS; measure the difference voltage between the output line wires of new UPS and the parallel system to check if the voltage difference between them is less than 1V. If the difference is less than 1V, close the output live wire breaker. If the difference is more than 1V, check if the wirings are abnormal.
- h) Remove the cover board of the parallel port located on the UPS which has transferred to the maintenance bypass and push the other end of the parallel cable into the slot of the parallel kit and fasten the connector. Screw the cover board of the parallel port back again.
- i) Close the input breakers of all of the UPSs (including the new UPS) in the parallel system. After all of the UPSs transfer to the bypass mode, screw the maintenance cover board back again.
- j) Turn on each UPS in turn and observe their display. Make sure that each UPS displays normally and all the UPSs transfer to the INV mode together. Measure the voltage on the JP1 and JP2 on the terminal block of each UPS to check if the voltage difference between them is less than 1V. If the voltage difference is more than 1V, the output relay of the UPS may not be closed.
- k) Measure the voltage of each JP2 on each UPS to check if the voltage value is less than 5V (Generally 2V). If the difference is more than 5V, that means the new UPS needs to be regulated again or you need to check if the parallel cable of the parallel kit is normal.
- l) After all of them transfer to the bypass mode, remove the maintenance cover board of each UPS and set the maintenance switch from “BPS” to “UPS” and screw the maintenance cover board back again.
- m) Turn on the UPSs in the utility power INV mode to perform the parallel operation.

Note: If the UPS is abnormal in the above debugging, please perform maintenance according to the operating process of removing a stand-alone.

5. Connection and Operation

Operating process of removing stand-alone:

- a) If you need to remove one UPS from the UPS parallel system which is in normal running, press the Power-off button of the UPS that is confirmed to be removed twice continuously and the UPS will cut off its output immediately;
- b) Turn off the input breaker, the external mains input breaker, the output breaker and the battery switch of the UPS that will be removed.
- c) Press the other UPSs' power-off button. After all of them transfer to the bypass mode, remove the cover board of each UPS and set the maintenance switch from "UPS" to "BPS" and then turn off the input breaker of each UPS.
- d) After you remove one UPS, you need to connect the short connection wire of the JP1 and JP2 located on the terminal block of the UPS if the rest UPS system only remains one UPS running by itself.
- e) After all panels of the UPSs do not display anything, remove the cover board of the parallel port on the UPS, which is connected with the parallel cable of the UPS that need to be removed. Remove the parallel cable and screw the cover board of the parallel port back again.
- f) Remove the cover board of the parallel port located on the UPS, that need to be removed, and remove the parallel cable, and then screw the cover board back again.
- g) Close all of the input mains breakers of the remained UPSs. After all UPSs transfer to the bypass mode, set the UPS maintenance switch from "BPS" to "UPS" and screw the maintenance cover board back again. Then turn on all of the UPSs in the utility power INV mode to perform the parallel operation.
- h) If the removed UPS will be used in a stand-alone mode, then JP1 and JP2 on the terminal block should be connected with a short connection wire.

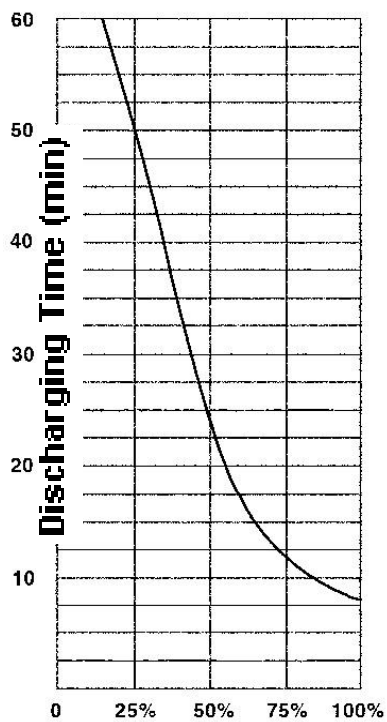
Notes for parallel maintenance:

- 1) *When UPS combine system work at inverter mode, make sure that all UPS maintain switches at the same place, that is to say, be at the position of "UPS", or be at the position of "BPS".*
- 2) *When turning on the UPS combine system before enter into inverter mode, UPS output switch must at "OFF" model.*
- 3) *When UPS combine system work at inverter model, please do not operate any UPS maintain switch.*

5. Connection and Operation

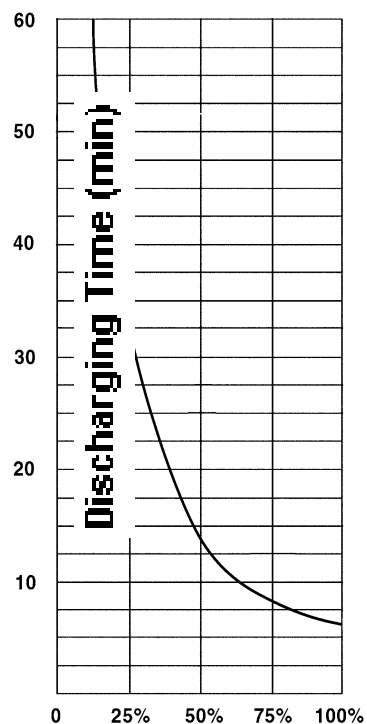
6. Backup time for the standard model

The backup time of standard model may vary from different models and load level. Please refer to the following:



Load level

Backup time of FRUK19-6K



Load level

Backup time of FRUK19-10K

5. Connection and Operation

5.5.2 Battery Maintenance

POWER-ALL MODE FRUK-01 Series ONLINE UPS only requires minimal maintenance. The battery used for standard models are value-regulated sealed lead-acid maintenance free battery. These models require minimal repairs. The only requirement is to charge the UPS regularly in order to maximize the expected life of the battery. When being connected to the utility power, whether the UPS is turned on or not, the UPS will keep charging the batteries and also offer the protective function of overcharging and over-discharging.

The UPS should be charged once every 4 to 6 months if it has not been used for a long time.

In the regions of hot climates, the battery should be charged and discharged every 2 months. The standard charging time should be at least 12 hours.

Under normal conditions, the battery life could last for 3 to 5 years. In case the battery is found not in a good condition, earlier replacement should be made. Battery replacement should be performed by qualified personnel.

Replace batteries with the same number and the same type of batteries.

Do not replace the battery individually. All the batteries should be replaced at the same time by following the instructions of the battery supplier.

Normally, the batteries should be charged and discharged once every 4 to 6 months. Charging should begin after the UPS shuts down automatically in the course of discharging, the standard charging time for the standard UPS should be at least 12 hours.

5. Connection and Operation

5.5.3 Notes for Battery Disposal and Battery Replacement

- 1) Before disposing of batteries, remove conductive jewelry such as necklace, wrist watches and rings.
- 2) If it is necessary to replace any connecting cables, please purchase the original materials from the authorized distributors or service centers, so as to avoid overheating or spark resulting in fire due to insufficient capacity.
- 3) Do not dispose of batteries or battery packs in a fire, they may explode.
- 4) Do not open or mutilate batteries, released electrolyte is highly poisonous and harmful to the skin and eyes.
- 5) Do not short the positive and negative of the battery electrode, otherwise, it may result in electric shock or fire.
- 6) Make sure that there is no voltage before touching the batteries. The battery circuit is not isolated from the input potential circuit. There may be hazardous voltage between the battery terminals and the ground.
- 7) Even though the input breaker is disconnected, the components inside the UPS are still connected with the batteries, and there are potential hazardous voltages. Therefore, before any maintenance and repair works are carried out, switch off the breaker of the battery pack or disconnect the connecting jumper wire between the batteries.
- 8) Batteries contain hazardous voltage and current. Battery maintenance such as the battery replacement must be carried out by qualified personnel who are knowledgeable about batteries. No other persons should handle the batteries.

6. Product Specification

6.1 Technical Data for FRUK19-6K/ FRUK19-10K

1) General Specification

Model		FRUK19-6K		FRUK19-10K		FRUK19-15K	
Power Rating		6KVA/4.2KW		10KVA/7KW		15KVA/10.5KW	
Frequency (Hz)		50/60		50/60		50/60	
Input	Voltage	(176-276)VAC		(176-276)VAC		(176-276)VAC	
	Current	31A max.		50A max		75 A max	
Battery	Voltage	240VDC		240VDC		240VDC	
	Current	24A max		40A max		60 A max	
Output	Voltage	240VAC	120VAC	240VAC	120VAC	240VAC	120VAC
	Current	27A	54A	45A	90A	68A	136A
Dimension (W*D*H) mm		260x570x893		260x570x893		260x570x955	
Weight (kg)		137		151		150	

2) Electrical Performance

Input			
Model	Voltage	Frequency	Power Factor
FRUK19-6K/ FRUK19-10K	Single-phase	46Hz-54Hz or 56Hz-64Hz	>0.98 (Full load)
FRUK19-15K	Single-phase	46Hz-54Hz or 56Hz-64Hz	>0.95 (Full load)

Output					
Voltage Regulation	Power Factor	Frequency tolerance.	Distortion	Overload capacity	Current crest ratio
±1%	0.7 lag	Synchronized ±4Hz in Line mode (AC mode) ; ±0.1% of normal frequency in Battery mode	THD<2% Full load (Linear Load)	105%-130% load transfers to bypass mode after 10 minutes >130% load transfers to bypass mode after 1 second and shutdown the output after 1 minute	3:1 maximum

3) Operating Environment

Temperature	Humidity	Altitude	Storage temperature
0℃-40℃	<95%	<1000m	0℃-40℃

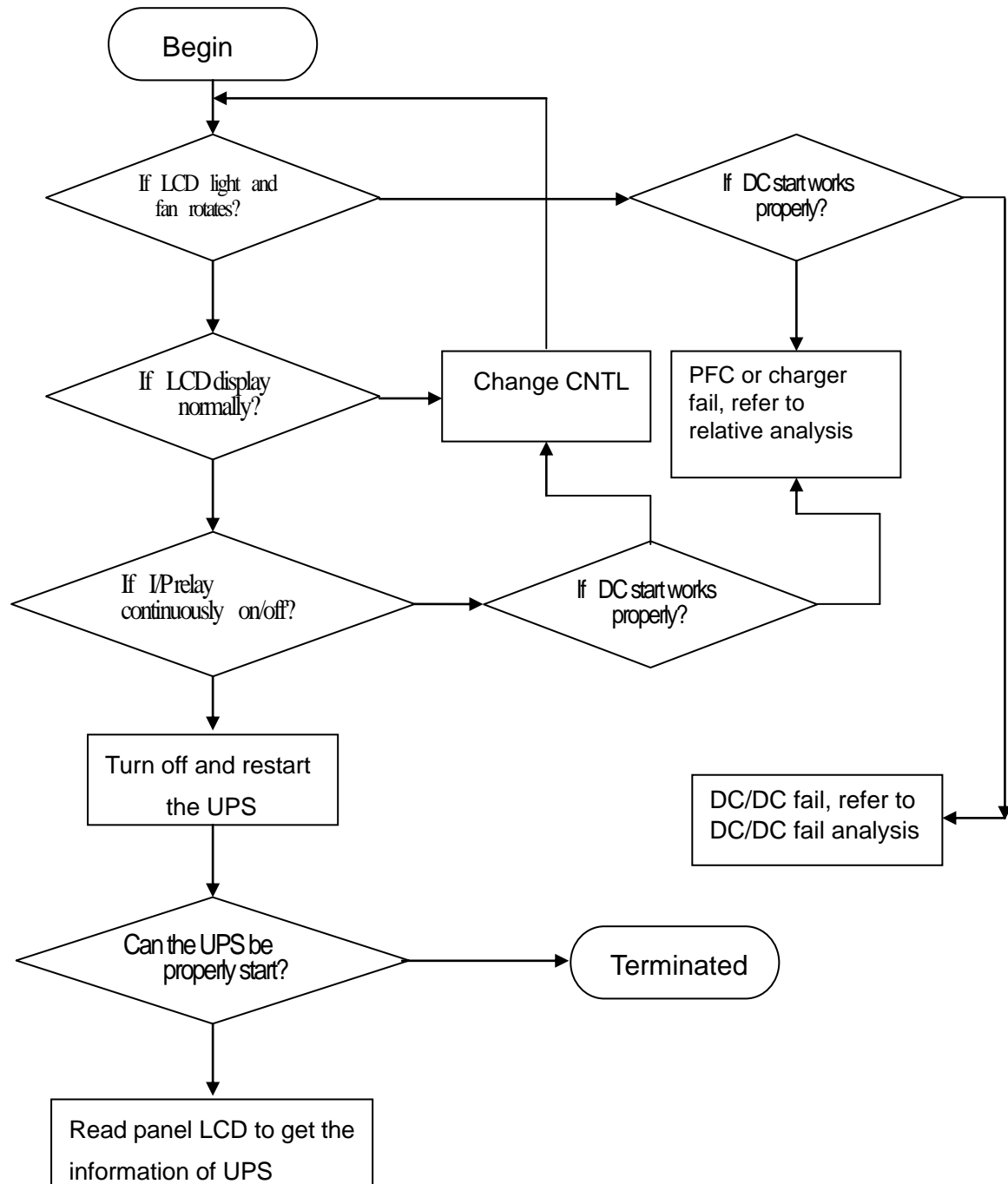
Note: if the UPS is installed or used in a place where the altitude is above than 1000m, the output power must be derated in use, please refer to the following:

Altitude (M)	1000	1500	2000	2500	3000	3500	4000	4500	5000
Derating Power	100%	95%	91%	86%	82%	78%	74%	70%	67%

7. Trouble Shooting

Due to careful design and strict tests of our products, failures of the UPS seldom occur. However, once they do fail in some situations, please check them according to **Trouble Shooting Chart**, which will help you solve the most problems on UPS.

Trouble Shooting Chart



8. Maintenance

8.1 Operation

The UPS system contains no user-serviceable parts. If the battery service life (3 - 5 years at 25°C ambient temperature) has been exceeded, the batteries must be replaced. In this case please contact your dealer.

8.2 Storage

If the batteries are stored in temperate climatic zones, they should be charged every three months for 1 to 2 hours. You should shorten the charging intervals to two months at locations subject to high temperatures.

9. Operation

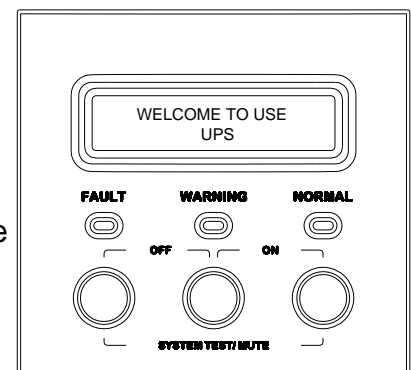
9.1 Check Prior to Start Up

1. Ensure the UPS is in a suitable positioning.
2. Check input cord is secured.
3. Make sure the load is disconnected or in the “OFF” position.
4. Check if input voltage meets the UPS rating required.

9.2 Operation Procedure

Please follow the instructions below for the UPS operation.

1. Once the AC source is connected, the LCD Display shall light up immediately to first display the main menu of greeting context and the Normal LED is blinking to indicate ready to switch on the inverter.



2. By pressing the UPS On/ Off Control Key and the LCD Select Down-key simultaneously for 3 seconds until the buzzer beeps twice, the UPS will start up and Normal LED lights up to indicate the power is from its inverter to the load.
3. When the UPS LCD Select Down-key and the LCD Select Up-key are pressed simultaneously for 3 seconds until the buzzer beeps twice, the inverter will be turned off and the UPS is on the standby status (LCD display illuminates and Normal LED is blinking) until AC source is disconnected.

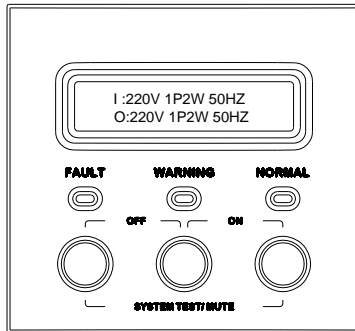
9.3 Storage Instruction

Disconnect input power in rear panel if you will not use it for long period. If the UPS is stored over 3 months, please keep supplying power to the UPS for at least 24 hours to ensure the batteries are fully recharged.

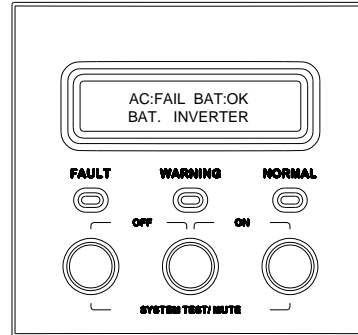
9.4 LCD Display

Use Up/ Down key to select menu-displays of the LCD described below. This screen will refresh once the system power is enabled.

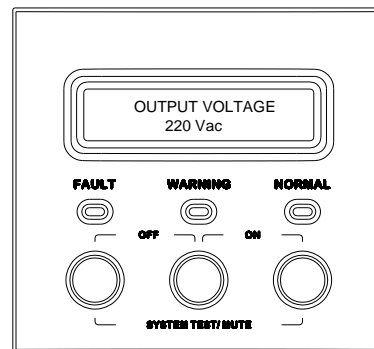
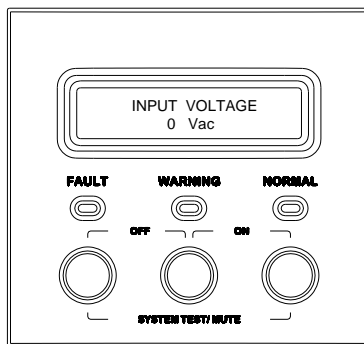
1. Rated Spec Menu



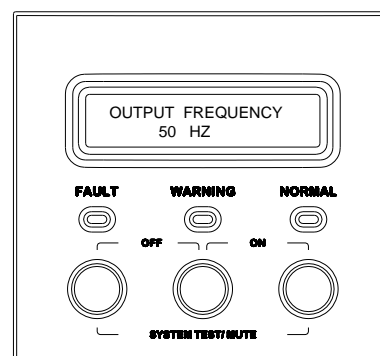
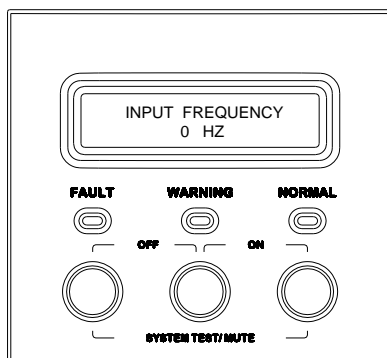
2. Status Menu



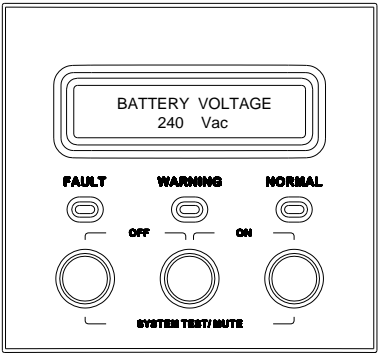
3. Voltage Menu



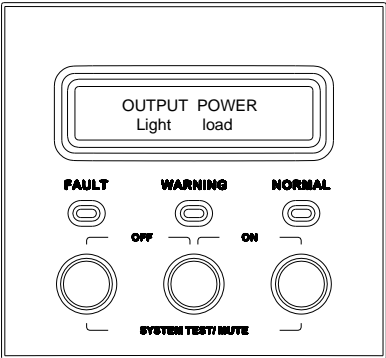
4. Frequency Menu



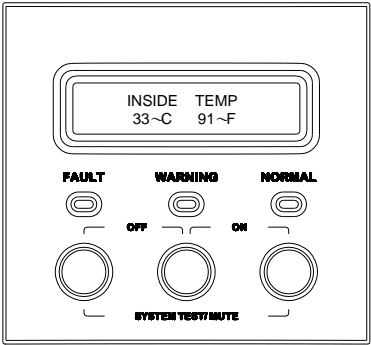
5. Battery Status Menu



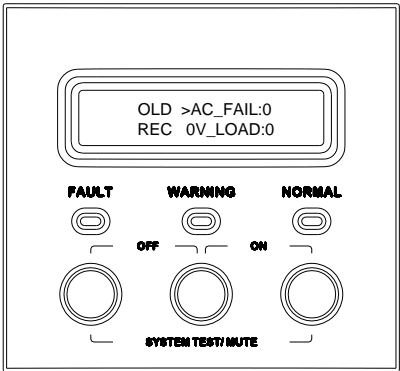
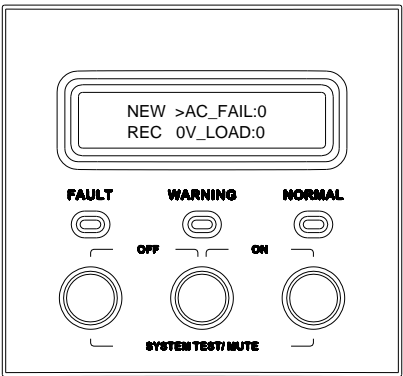
6. Output Power Menu



7. Temperature Menu

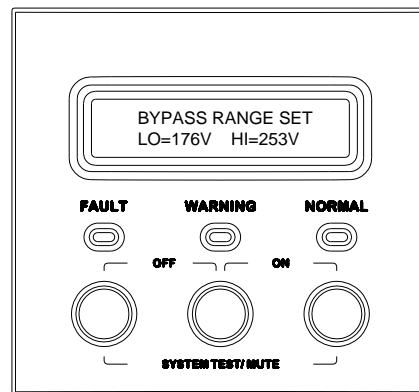


8. History Record Menu

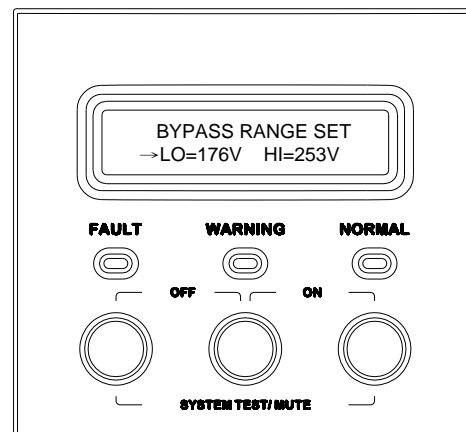


9. Bypass Range Set Menu

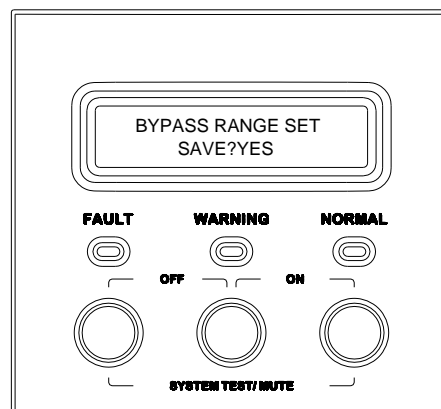
A. To protect the load, the function of bypass auto-transfer is activated only when the AC main voltage is within the range of LO (low) and HI (high). In this screen, press On/ Off Control Key to enter the following steps for LO/ HI voltage setting.



B. The cursor (→) will pop up to indicate the item newly selected. Press on/off Control Key to get the item of LO or HI range the user want to adjust.



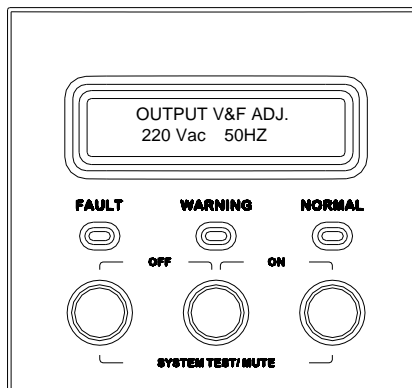
C. Use Up or Down-key to adjust the voltage (changing 1V by every press). LO (low rang):176V+/- 20V, HI(high range):253V+/- 20V).



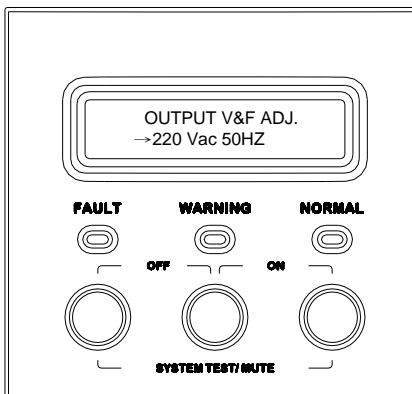
D. Once the value is confirmed, press on/off Control Key again to save the data.

10. Output Voltage Set Menu

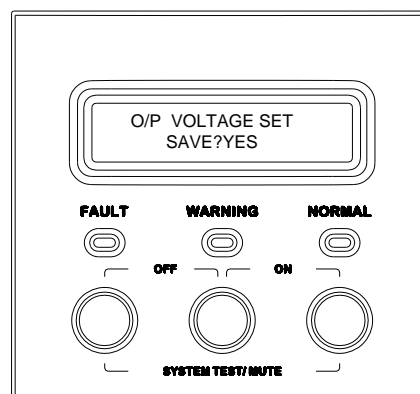
A. In this screen, press on/off Control Key to enter the following steps for output voltage setting.



B. The cursor (→) will pop up to indicate the output voltage newly selected.



C. Use Up or Down-key to adjust the output voltage (220V, 230V, and 240V are available only) or output frequency (50Hz, 50HzP, 60Hz and 60HzP are available only).



D. Once the correct voltage is selected, press on/off Control Key again to save the data.

10. Communication Port

10.1 RS232 Interface

The following is the pin assignment and description of DB-9 connector. Supply RS-232 for monitoring software of **UPSilon 2000**.

Pin #	Description	I/O
2	TXD	Output
3	RXD	Input
5	GND	Input

10.2 AS400 Interface (Optional)

Except for the communication protocol as mentioned above, this series UPS has AS400 card (an optional accessory) for AS400 communication protocol. Please contact your local distributor for details. The following is the pin assignment and description of DB-9 connector in AS400 card.

Pin #	Description	I/O
1	UPS Fail	Output
2	Summary Alarm	Output
3	GND	Input
4	Remote Shutdown	Input
5	Common	Input
6	Bypass	Output
7	Battery Low	Output
8	UPS ON	Output
9	Line Loss	Output

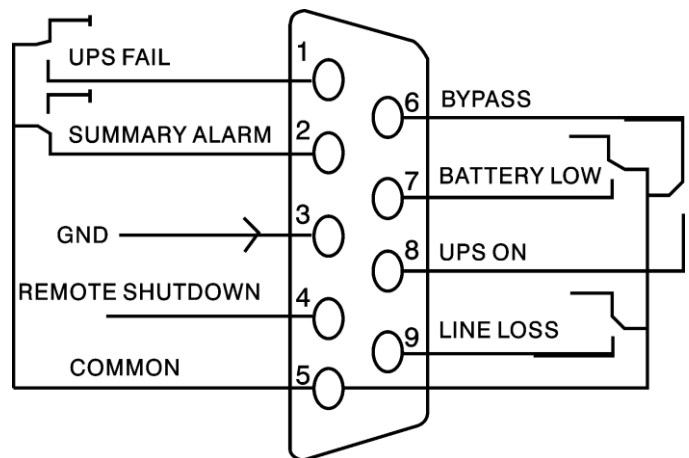
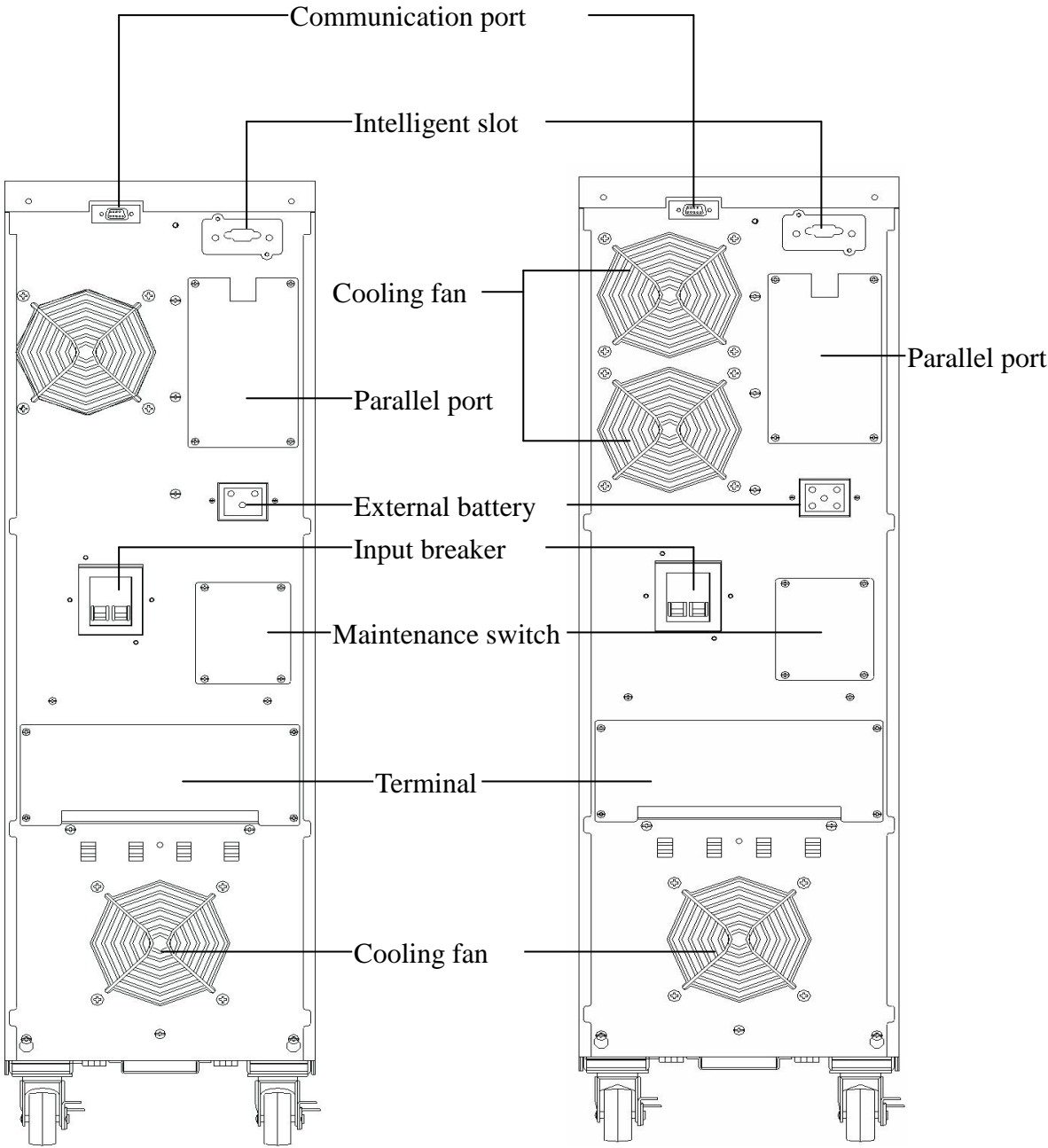


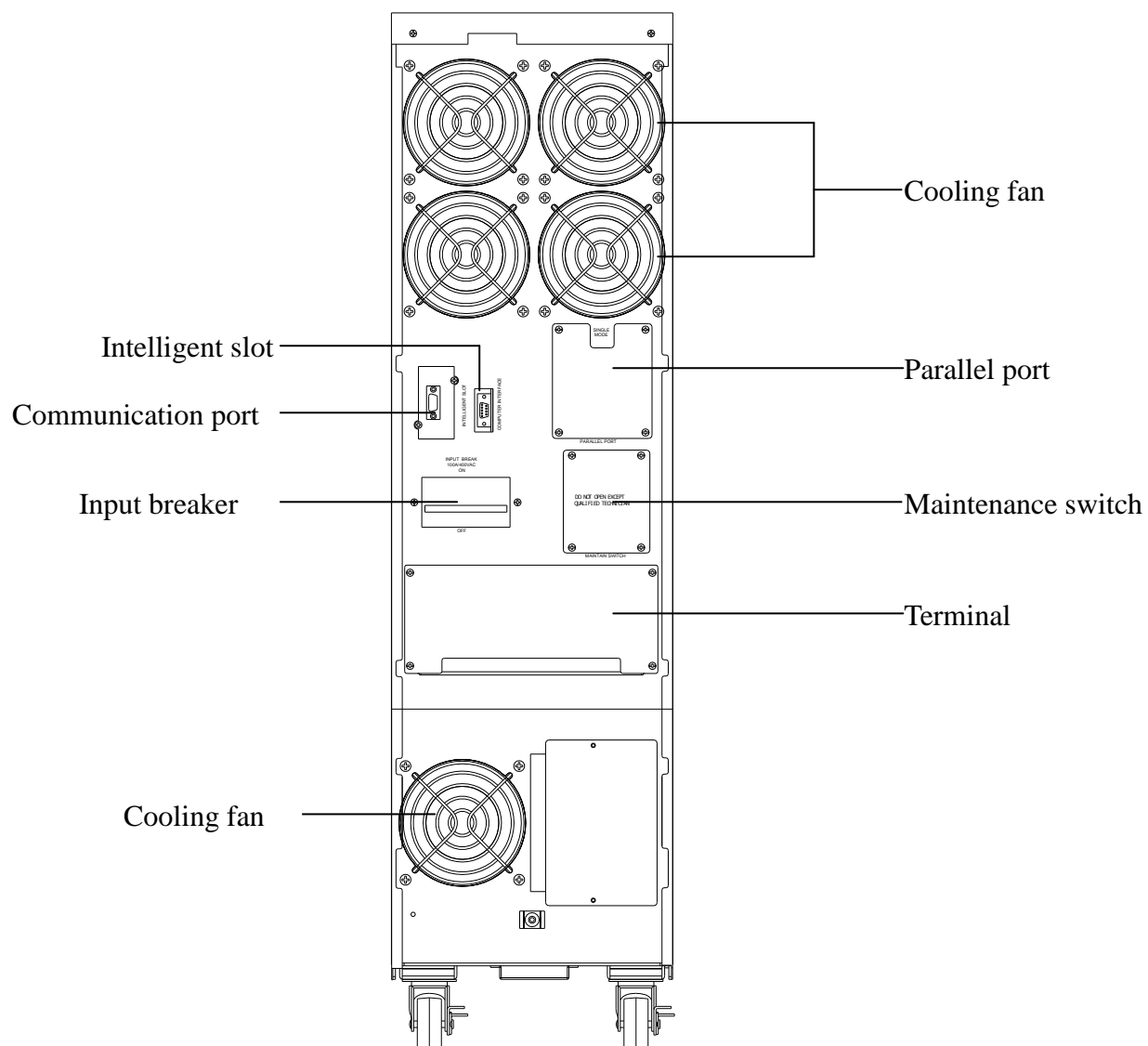
Figure 10.2: DB-9 Interface of AS400 communication protocol

11.Appendix 1 – Outline Description and Back Panel



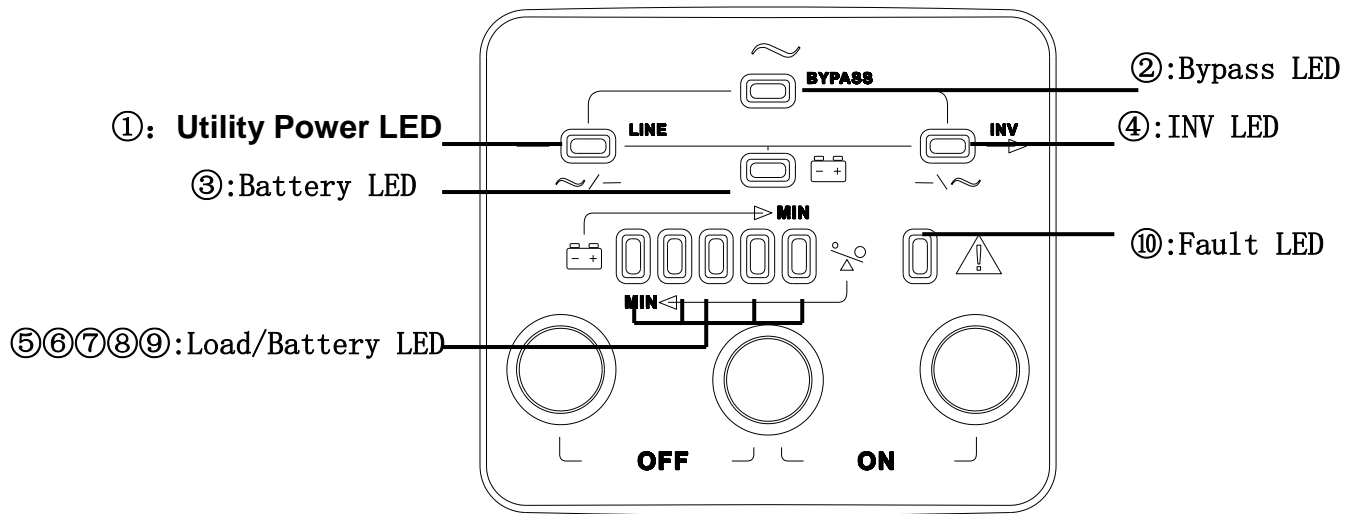
Back view of FRUK19-6K

Back view of FRUK19-10K



Back view of FRUK19-15K

12 Appendix- 2 Display panel-LED



- **Power ON/OFF:** To turn on the UPS simply by pressing the control key with the On/Test/Mute key simultaneously on the front panel continuously for 1 second. Press the control key with the off key simultaneously on the front panel continuously for 1 second to turn off the UPS.
- **Bypass LED (orange LED):** Whenever the bypass LED is turned on, it shows that the loading current is supplied directly from the utility power.
- **Utility power LED (green LED):** Whenever the utility power LED is turned on, it shows that the utility power is normal.
- **Inv LED (green LED):** Whenever the INV LED is turned on, it shows that the loading current is supplied from utility power or battery via the inverter.
- **Battery LED (orange LED):** Whenever the battery LED is turned on, it shows that the loading current is supplied from battery via the inverter.
- **Fault LED (red LED):** Whenever the fault LED is turned on, it shows that the UPS is in abnormal condition.
- **#5-#9 LEDs (the #9 LED is orange and the #5-#8 LEDs are green):** These LEDs indicate the percentage of the load capacity in utility power mode or battery capacity level in battery mode.

No.	Operating state		LED display										Alarm warning
			1 #	2 #	3 #	4 #	5 #	6 #	7 #	8 #	9 #	10 #	
1	Utility Power Mode	0~35% Load capacity	●			●	●						none
2		36%~55% Load capacity	●			●	●	●					None
3		56%~75% Load capacity	●			●	●	●	●				None
4		76%~95% Load capacity	●			●	●	●	●	●			None
5		96%~105% Load capacity	●			●	●	●	●	●	●		None
6	Battery Mode	0~20% Battery capacity			●	●					●		Beep once every sec
7		21%~40% Battery capacity			●	●				●	●		Beep once every 4 sec
8		41%~60% Battery capacity			●	●			●	●	●		Beep once every 4 sec
9		61%~80% Battery capacity			●	●		●	●	●	●		Beep once every 4 sec
10		81%~100% Battery capacity			●	●	●	●	●	●	●		Beep once every 4 sec
11	Bypass mode		●	●			●	↑	↑	↑	↑		Beep once every 2 min.
12	overloaded in utility mode and UPS still in INV mode		●			●	●	●	●	●	●	●	Beep twice every sec.
13	overloaded in utility mode and UPS in bypass mode		●	●			●	●	●	●	●	●	Beep twice every sec.
14	Utility power abnormal		★	↑	↑	↑	●		↑	↑	↑		↑
15	Overloaded in battery mode, Early-warning		↑		●	●	↑	↑	↑	↑	●		Beep twice every sec.
16	Overloaded in battery mode, Cut off the output		↑								●	●	Continuously beep
17	Over temperature		↑	↑			●					●	Continuously beep
18	Inv abnormal		↑	↑				●				●	Continuously beep
19	Output short circuited		↑					●			●	●	Continuously beep
20	BUS voltage abnormal		↑	↑					●			●	Continuously beep
21	Charger and battery failed		↑	↑	★	↑						●	Beep once every sec
22	BAT SCR failed		↑	↑			●			●		●	Continuously beep
23	Fan abnormal		↑	↑	↑	↑	●				●	●	Beep once every sec
24	INV RLY failed		↑	↑			●		●			●	Continuously beep
25	Communication abnormal		↑	↑					●	●		●	Continuously beep
26	Parallel abnormal		↑				●			●	●	●	Continuously beep

●: Solid ON ★ : Flash ↑ : LED display and alarm warning are dependent on other conditions.